Notice of Allowability	Application No.	Applicant(s)	
	10/029,142	DINERSTEIN, JONATHAN J.	
	Examiner	Art Unit	
	Charles E Parsons	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to _____.

2. ☒ The allowed claim(s) is/are *1,2,5-10,12-16 and 18-22*.

3. ☒ The drawings filed on *20 December 2001* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

CHRIS KELLEY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Allen Turner on 11/05/2004.

The application has been amended as follows:

Replace Claim 1

1 (Amended) A method for motion searching each macroblock of a video frame, comprising iteratively decreasing block size until a rate-distortion (RD) has been minimized and selectively reducing the number of block sizes searched, wherein said motion searching each block of said video frame comprises:

performing a motion search on said video frame relative to a previous video frame using 16x16, 8x16 and 16x8 block sizes',

calculating a rate-distortion (RD) for each of said 16xl6, 8x16 and 16x8 block sizes;

if said calculated RD is lowest for said 16x16 block size, motion search is complete, otherwise continue;

performing a motion search on said video frame relative to said previous video frame using an 8x8 block size;

calculating a RD for said 8x.8 block size;

if said calculated AD for said 8x8 block size is not lower than said calculated .RD for said said 16xl6, 8x16 and 16x8 block sizes then said motion search is complete, otherwise continue;

performing a motion search on said video frame relative to said previous video frame using 4x8 and 8x4 block sizes;

calculating a RD for said 4x8 and 8x4 block sizes;

if neither of said calculated RDs for said 4x8 and 8x4 block sizes is lower than said

calculated RD for said16x16, 8x16, 16x8 and 8x8 block sizes, then said motion search is complete, otherwise continue;

performing a motion search on said video frame relative to said previous video frame using a 4x4 block size; and

determining a block size with lowest calculated RD and motion search is complete.

Cancel claim 3

In claim 4 after claim replace 3 with 1.

In claim 8 after "Compensated errors" add --

wherein said performing said motion search on each macroblock of said video frame comprises:

performing a motion search on said video frame relative to a previous video frame using 16xl6, 8x16 and 16x8 block sizes;

calculating a rate-distortion (.RD) for each of said16x16, 8x16 and 16x8 block sizes;

if said calculated RD is lowest for said 16x16 block size, motion search is complete, otherwise continue,

performing a motion search on said video frame relative to said previous video frame using an 8x8 block size;

calculating a RD for said 8x8 block size;

if said calculated RD for said 8x8 block size is not lower than said calculated RD for said said 16x16, 8x16 and 16x8 block sizes then said motion search is complete, otherwise continue;

performing a motion search on said video frame relative to said previous video frame using 4x8 and 8x4 block sizes;

calculating a RD for said 4x8 and 8x4 block sizes;

if neither of said calculated Al)s for said 4x8 and 8x4 block sizes is lower than said

calculated RD for said16x16, 8x16, 16x8 and 8x8 block sizes, then said motion search is complete, otherwise continue;

performing a motion search on said video frame relative to said previous video frame using a 4x4 block size; and

determining a block size with lowest calculated RD and motion search is complete.--

Cancel Claim 11

In Claim 15 after "compensated errors" add --

wherein said performing said motion search on each macroblock of said video âame further comprises:

performing a motion search on said video frame relative to a previous video frame using 16x16, 8x16 and 16x8 block sizes;

calculating a rate-distortion (#D) for each of saidl6x16, 8x16 and 16x8 block sizes;

if said calculated .RD is lowest for said 16x16 block size, motion search is complete, othenvise continue;

performing a motion search on said video frame relative to said previous video frame using an 8x8 block size;

calculating a RD for said 8x8 block size;

if said calculated .RD for said 8x8 block size is not lower than said calculated RD for said said16x16, 8x16 and 16x8 block sizes then said motion search is complete, othenvise continue;

performing a motion search on said video frame relative to said previous video frame using 4x8 and 8x4 block sizes',

calculating a SD for said 4x8 and 8x4 block sizes;

if neither of said calculated RD's for said 4x8 and 8x4 block sizes is lower than said calculated RD for saidl6x16, 8xl6, 16x8 and 8x8 block sizes, then said motion

search is complete, otherwise continue;

performing a motion search on said video frame relative to said previous video frame using a 4x4 block size; and

determining a block size with lowest calculated RD and motion search is complete.--

Cancel Claim 17.

Allowable Subject Matter

2. Claims 1,2, 4-10, 12-16 and 18-22 are allowed.

3. The following is an examiner's statement of reasons for allowance: The elements of the claims were not found in a prior art search nor considered obvious by the Examiner. The closest prior art found was that of Chaddha, however Chaddha does not disclose all of the steps claimed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles E Parsons whose telephone number is 703-305-3862. The examiner can normally be reached on M-TH 7AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Kelley can be reached on 703-305-4856. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CEP

CHRIS KELLEY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600